

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : Docket No.: OT-4355
Pedro S. Baranda et al. : Date: September 25, 2002
Appln. No.: 09/218,990 : Examiner: T. Tran
Filing Date: December 22, 1998 : Group Art Unit: 3652
Title: TENSION MEMBER FOR AN ELEVATOR

Commissioner for Patents
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Washington, D.C. 20231

APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES
PURSUANT TO 37 C.F.R. §1.191**1. REAL PARTY IN INTEREST**

The real party in interest is Otis Elevator Company. The assignment of assignor's interest was recorded on May 28, 1999 at reel 9981, frame 970.

2. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, the appellant's legal representative, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

3. STATUS OF CLAIMS

Claims 1-3, 5-15, 18, 20, 23 and 45-50 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,461,850 (Bruyneel et al.).

Claims 21 and 22 stand rejected under §103(a) as allegedly being unpatentable over Bruyneel et al., further in view of U.S. Patent No. 4,534,163 (Schuerch).

Claim 4 has been canceled. Claims 16, 17, 19 and 24-44 stand withdrawn from consideration as being drawn to a non-elected species/invention.

4. **STATUS OF AMENDMENTS**

No amendments were filed subsequent to the rejection.

5. **SUMMARY OF INVENTION**

Claim 1, the sole independent claim that is pending and under consideration in the present application, is directed to a tension member for providing lifting force to a car of an elevator system. The tension member comprises a plurality of discrete cords and a coating layer substantially enveloping said plurality of cords. The cords are constructed from a plurality of individual wires, wherein all wires are less than .25 millimeters in diameter, and the plurality of cords are arranged side-by-side. The coating layer has an aspect ratio, defined as the ratio of width w relative to thickness t , greater than one.

Support for the invention claimed in claim 1 is found throughout the specification, for example in the paragraph beginning at page 6, line 6 and in the paragraph beginning at page 8, line 8.

As noted in the subject specification, the claimed aspect ratio results in distributing the rope pressure across the width of the tension member and reduces the maximum rope pressure relative to a round rope of comparable cross-sectional area and load carrying capacity. The maximum rope pressure is significantly reduced as compared to a conventionally roped elevator having a similar load carrying capacity. Also, the effective rope diameter 'd' (measured in the bending direction) is reduced for the equivalent load bearing capacity. Therefore, smaller values for the sheave diameter 'D' may be attained without a reduction in the D/d ratio. A smaller sheave diameter reduces the required torque and increases the rotational speed of the machine driving the sheave, thus permitting the use of less costly, more compact, high-speed motors without the need for a gearbox.

The importance of the claimed wire diameter feature, as noted in the subject specification, is that the smaller diameter wire can *withstand the bending radius* of a smaller diameter sheave (around 100 millimeters in diameter) *without placing too much stress* on the strands of the flat rope. Thus, the smaller wire diameter is critical to maximizing the above-noted benefits of the use of a sheave of smaller diameter.

(6) ISSUE(S)

- (a) Whether claim 1 is unpatentable under §103(a) over Bruyneel et al.

(7) GROUPING OF CLAIMS

For the purposes of this Appeal, all pending claims under consideration (1-3, 5-15, 18, 20-23 and 45-50) will be grouped together.

(8) ARGUMENT(S)

- (a) Whether claim 1 is unpatentable under §103(a) over Bruyneel et al.

According to the Final Rejection, claims 1-3, 5-15, 18, 20, 23 and 45-50 are unpatentable under §103(a) over Bruyneel et al., and claims 21 and 22 are unpatentable under §103(a) over Bruyneel et al., further in view of Schuerch.

The Final Rejection states that Figure 9 of Bruyneel et al. discloses a tension member comprising a plurality of discrete cords arranged side-by-side and constructed from a plurality of individual wires having a diameter range of 0.15 to 1.20 mm. The Final Rejection further states that Bruyneel et al. discloses a coating layer that envelopes the cords and has an aspect ratio (width/thickness) of greater than two. The Final Rejection goes on to indicate that it would have been an obvious choice, based upon the application and design preferences of the constructor, to have all of the wires having a diameter of less than 0.20 mm.

Applicants respectfully submit that the Examiner has not met the burden of proof required to support a rejection under 35 U.S.C. §103. When an application is submitted to the Patent and Trademark Office, case law dictates that 35 U.S.C. §103 places the burden of proof on the PTO to establish a prima facie case of obviousness.¹ Once the prima facie case has been established, then the burden of going forward with the evidence to rebut the prima facie case shifts to the applicant.

¹In *re* Fritch, 23 U.S.P.Q. 2d. 1780 (Fed. Cir. 1992), *In re* Piasecki, 745 F.2d. 1468, 1471-1472, 223 U.S.P.Q. 785, 787-788 (Fed. Cir. 1984).

Only the burden of going forward with evidence to rebut shifts to the applicant, however. The burden of persuasion remains with the PTO.

In this instance, a *prima facie* case would necessarily have to first establish that the present invention would be obvious in view of the cited prior art. In order to support a *prima facie* obviousness type rejection, the Examiner must take into account all the limitations in the rejected claim,² including any limitations expressed using functional language.³ Further, the obviousness must be determined based on the claimed subject matter as a whole, including any results and advantages produced by the claimed subject matter.⁴ Further, to establish a *prima facie* case of obviousness, there must be some teaching, suggestion or incentive to support the specific combination of references.⁵

As correctly noted in the Final Rejection, Figure 9 of Bruyneel et al. describes a coating layer that envelopes a plurality of side-by-side cords and that has an aspect ratio of greater than two. However, that Figure illustrates a conveyor belt, and not a tension member for providing lifting force to a car of an elevator system, as recited in claim 1. Although Bruyneel et al. does also discuss using rubberized cord as a hoisting cable for mines or elevators, it does so in connection with the round rubberized cord of Figure 2 of that patent. There is no disclosure or suggestion within Bruyneel et al. of a tension member for providing lifting force to a car of an elevator system that has the claimed side-by-side cords or aspect ratio.

The recitation of a tension member for providing lifting force to a car of an elevator system describes and limits the claimed invention. Although appearing in the preamble of the claim, the recitation in question does not simply refer to the prior art or to a possible use, and therefore must be taken into consideration when determining the scope of claim 1.⁶ Therefore, since Bruyneel et al. does not disclose or suggest a tension member for providing lifting force to

² Carl Schenck, A.G. v. Nortron Corp., 713 F.2d 782, 218 U.S.P.Q. 698 (Fed. Cir. 1983); Carman Industries v. Wahl, 724 F.2d 932, 220 U.S.P.Q. 481 (Fed. Cir. 1983).

³ Lewmar Marine, Inc. v. Bariant, Inc., 827 F.2d 744, 3 U.S.P.Q.2d 592 (Fed. Cir. 1983).

⁴ Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 7 U.S.P.Q.2d 1315 (Fed. Cir. 1988); In re Chupp, 816 F.2d 643, 2 U.S.P.Q.2d 1437 (Fed. Cir. 1987); Fromson v. Advanced Offset Plate, 755 F.2d 1549, 225 U.S.P.Q. 26 (Fed. Cir. 1985).

⁵ In re Geiger, 815 F.2d 686, 2 U.S.P.Q.2d 1276 (Fed. Cir. 1987); ACS Hospital Systems Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984).

⁶ See Karsten Manufacturing Corp. v. Cleveland Golf Co., 242 F.3d 1376, 58 U.S.P.Q.2d 1286 (Fed. Cir. 2001); Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 51 U.S.P.Q.2d 1161 (Fed. Cir. 1999).

a car of an elevator system that has the claimed side-by-side cords or aspect ratio, the invention recited in claim 1 would not have been obvious in view of Bruyneel et al.

Additionally, the Final Rejection also correctly notes that Bruyneel et al. describes a rope having wires in a range from 0.15mm to 1.2 mm. The two examples in Bruyneel et al. have "filaments" in the range of 0.57 to 0.85 mm (example 1) and 0.20 to 0.29 mm (example 2). There is no disclosure or suggestion within Bruyneel et al. of a tension member formed from cords having all wires with a diameter less than 0.25 mm, as claimed in claim 1.

As noted above, this feature is critical to the claimed invention, in that it permits maximizing the use of a sheave of smaller diameter. There is no recognition in Bruyneel et al. of the desirability to withstand a smaller bending radius (permitting use of a smaller diameter sheave), much less the importance of keeping all wire diameters small to achieving that goal. Without such a motivating factor, there would have been no objective reason to use (especially in an elevator tension member) all smaller wires, which generally have lower tensile strength. Thus, it would not have been obvious from the disclosure of Bruyneel et al. to so restrict the wire size.⁷

Therefore, Bruyneel et al. does not disclose or suggest each feature of the invention claimed in claim 1.

Schuerch, which is cited for its disclosure regarding a thermoplastic coating layer, does not overcome the above-noted deficiencies in the teachings of Bruyneel et al.

Therefore, with respect to the rejection of claims 1-3, 5-15, 18, 20-23 and 45-50, the Examiner has failed to meet his burden to establish a prima facie case of obviousness under 35 U.S.C. § 103 because the cited art does not disclose or suggest all of the features recited in independent claim 1, and it would not have been obvious to modify the prior art rope to include such features.

⁷ In re Geiger, 815 F.2d 686, 2 U.S.P.Q.2d 1276; ACS Hospital Systems Inc., 732 Fed.2d 1572, 221 U.S.P.Q. 929.

(9) OATH/DECLARATION

It was noted in the Office Action that the Oath/Declaration was missing the acknowledgement of the duty to disclose material information that became available between the filing dates of co-pending application number 09/031,108 and this continuation in part application. A new Declaration has been executed and will be submitted separately.

Conclusion

As Applicants have traversed each and every rejection raised by Examiner, it is respectfully requested that the rejections be reversed and the rejected claims be passed to issue.

Please charge any deficiency in fees associated with filing this response to our Deposit Account No. 15-0750, Order No. OT-4355.

Respectfully submitted,

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9. **APPENDIX**

Claims involved in the Appeal:

1. (Amended) A tension member for providing lifting force to a car of an elevator system, comprising:

a plurality of discrete cords, constructed from a plurality of individual wires, wherein all wires are less than .25 millimeters in diameter, said plurality of cords being arranged side-by-side;

a coating layer substantially enveloping said plurality of cords and having an aspect ratio defined as the ratio of width w relative to thickness t , greater than one.

2. A tension member according to claim 1 wherein said plurality of wires are in a twisted pattern creating strands of several wires and a center wire.

3. A tension member according to claim 2 wherein said strand pattern is defined as said several wires twisted around said one center wire.

5. A tension member according to claim 3 wherein said plurality of cords are each in a pattern comprising several strands around a center strand.

6. A tension member according to claim 5 wherein said cord pattern is several outer strands twisted around said center strand.

7. A tension member according to claim 6 wherein said center strand comprises said several wires twisted around said one center wire in a first direction and said outer strands each comprise said several wires twisted around said one center wire in a second direction and said outer strands are twisted around said center strand in said first direction.

8. A tension member according to claim 6 wherein each said center wire of each strand is larger than all wires twisted therearound.

9. A tension member according to claim 8 wherein said center wire of said center strand is larger than said center wire of each said outer strands.
10. (Amended) A tension member according to claim 1 wherein said wires diameters are less than .20 millimeters.
11. A tension member according to claim 6 wherein said center wire in said center strand is of a larger diameter than all other wires in each cord of said plurality of cords.
12. A tension member according to claim 1 wherein said cords are arranged in spaced relation to each other.
13. A tension member according to claim 1 wherein the aspect ratio is greater than or equal to two.
14. A tension member according to claim 1 wherein said coating layer defines a single engagement surface for the plurality of individual cords.
15. A tension member according to claim 14 wherein said coating layer extends widthwise such that the engagement surface extends about the plurality of individual cords.
18. A tension member according to claim 3, wherein the coating layer is formed from an elastomer.
20. A tension member according to claim 1 wherein said coating layer is an elastomer.
21. A tension member according to claim 20 wherein said elastomer is a thermoplastic urethane.
22. A tension member according to claim 21 wherein said urethane is transparent.

23. (Twice Amended) A tension member according to claim 1 wherein said cords are steel.
45. A tension member according to claim 2 wherein said several wires and said center wire is seven wires.
46. A tension member according to claim 3 wherein said several wires is six wires.
47. A tension member according to claim 5 wherein said plurality of cords each comprise seven strands.
48. A tension member according to claim 6 wherein said cord pattern is six strands twisted around said center strand.
49. A tension member according to claim 48 wherein said center wire of each strand is larger than all wires twisted therearound.
50. (Amended) A tension member according to claim 48 wherein said center wire of said center strand is larger than said center wire of each of said six strands.